

RESPONSE

Claims 1-9 and 17-23 were pending in this application. Claims 21-23 are cancelled without prejudice, claims 1 and 18-20 are amended, and new claim 24 is added by the present amendment. A marked-up copy of the amended claims in accordance with 37 C.F.R. § 1.121(c)(1)(ii) is enclosed. Claims 1-9, 17-20 and 24 are pending and presented for consideration.

Amendments to the claims

Claim 1 is amended to recite identifying a patient as having a current *Helicobacter pylori* infection if a nucleic acid is present in a length and an amount indicative of infection, the amount exceeding an amount indicative of an absence of current *Helicobacter pylori* infection. Support for the amendment is found in the originally-filed application at, for example, pages 3 and 6.

Claim 18 is amended to recite detecting a human nucleic acid in a patient stool sample and identifying a patient as having disease if the length of the nucleic acid is indicative of infection. Support for the amendment is found in the originally-filed application at, for example, pages 2, 3, 6 and 15-17.

Claims 19 and 20 are amended for consistency with amended claim 1.

Support for new claim 24 is found throughout the originally-filed application and at least, for example, at pages 9, 10, and 14.

Applicant submits that no new matter is introduced by these amendments.

Interview Summary

Applicant thanks Examiner Chunduru for the productive telephonic interview of October 11, 2002. At that interview Patrick Waller and the undersigned agent discussed independent claims 1, 2, 17, and 18 with Examiner Chunduru, with particular attention to the outstanding rejections under 35 U.S.C. §§ 102 and 112. Applicant has structured the present Amendment

and Response to reflect the substance of the telephonic interview, and invites Examiner Chunduru to contact the undersigned if there are any outstanding issues to be resolved.

Claim rejections under 35 U.S.C. § 112

Claims 1, 8-9 and 18-20 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Specifically, the Office action alleges that the terms “reference length” and “reference amount” in claims 1 and 20 are indefinite. Applicant has cancelled claim 20 without prejudice and have amended claim 1, removing the recitations of “reference length” and “reference amount”. The Office action further alleges that the recitation of “a patient sample comprising shed cells or cellular debris” in claim 18 is indefinite. Applicant has amended claim 18 to recite “a patient stool sample comprising shed cells or cellular debris.” In view of the amendments to the claims, Applicant requests reconsideration and withdrawal of this rejection.

Claim rejections under 35 U.S.C. § 102

Li et al. (1996) Dig. Dis. Sci. 41(11):2142-2149 (“Li”)

Claims 1, 6, 8 and 19 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Li. The Office action also discussed claim 20 in this context. Applicant respectfully traverses this rejection.

Applicant submits that Li does not anticipate the invention of independent claim 1, which recites identifying a patient as having a current *Helicobacter pylori* infection if a nucleic acid detected in a patient stool sample is present in a length and an amount indicative of infection. Li attempted to detect *H. pylori* DNA in feces; “[h]owever, the PCR assay was only able to detect *H. pylori* DNA in the feces of 15 of 61 patients (25%) with proven gastric *H. pylori* infection and one of the 10 patients without gastric *H. pylori* infection” (Li, Abstract). Li was unable to “explain why *H. pylori* DNA was detected by PCR in the stool from one patient while his gastric biopsy was negative by histologic stain, culture, and PCR assay” (Li, p. 2148). After referring to other published attempts to detect *H. pylori* DNA in feces, Li concluded that “these data suggest that currently PCR assays of fecal specimens may not be useful for the diagnosis of *H. pylori* infection and/or monitoring of eradication therapy” (Li, p. 2148).

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Applicant submits that Li does not identify a patient as having a current *Helicobacter pylori* infection if a nucleic acid is detected in a patient stool sample. On the contrary, Li concludes that PCR assays of fecal specimens may not be useful for diagnosis. Because Li does not teach or suggest identifying a patient as having a current *Helicobacter pylori* infection if a nucleic acid is detected in a patient stool sample, Applicant submits that Li cannot anticipate claim 1, or any claim depending from claim 1 (including, *e.g.*, claims 8, 19, and 20).

Applicant submits that Li also fails to anticipate claim 6. Claim 6 depends from claim 5 and, indirectly, from claim 2, incorporating each of their limitations by reference. Claim 2 recites comparing an amount of high-integrity *Helicobacter pylori* nucleic acid present in a patient sample to an amount of a non-*Helicobacter pylori* nucleic acid present in the patient sample. Applicant submits that Li does not consider non-*Helicobacter pylori* nucleic acid in a patient sample, and does not compare an amount of it to an amount of high-integrity *Helicobacter pylori* nucleic acid in the patient sample. Applicant submits that, consequently, Li cannot anticipate any of claims 2, 5, or 6.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

WO 91/09049 ("Tabaqchali")

Claims 2-5, 7, 17-18, and 22-23 (and perhaps 21) stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Tabaqchali. The Office action also discussed claim 21 in this context. Claims 21-23 have been cancelled without prejudice. Applicant respectfully traverses the rejection as applied to the pending claims.

Applicant submits that Tabaqchali does not anticipate claim 2, which recites comparing an amount of high-integrity *Helicobacter pylori* nucleic acid present in the patient sample to an amount of a non-*Helicobacter pylori* nucleic acid present in the patient sample. The Office action points, for example, to page 7, lines 5-16, disclosing that using a "pair of primers a 411 base pair product has been amplified" from supernatants of boiled *H. pylori* strains, but that "*Helicobacter mustelae* and other urease positive bacteria have been found to be PCR negative." Applicant submits that Tabaqchali does not anticipate claim 2 because Tabaqchali does not compare amounts of *Helicobacter pylori* and non-*Helicobacter pylori* nucleic acids in a patient

sample. Tabaqchali does not detect or quantify a non-*Helicobacter pylori* nucleic acid, and therefore cannot make a comparison. Indeed, Tabaqchali proves that *Helicobacter mustelae* is not detectable by the primer pair, *i.e.*, that the primer pair is specific to *Helicobacter pylori*. Tabaqchali appears to value specificity: "sequences are disclosed specific to *H. pylori* urease" (Tabaqchali, Abstract). Thus, Tabaqchali is unable to compare amounts of *Helicobacter pylori* and non-*Helicobacter pylori* nucleic acids from a patient sample. Tabaqchali does not even suggest that comparison of such nucleic acids would be desirable. Furthermore, Tabaqchali does not teach or suggest that the *Helicobacter pylori* and non-*Helicobacter pylori* nucleic acids were present in a patient sample. Accordingly, Applicant submits that Tabaqchali does not anticipate claim 2 or any claim depending directly or indirectly from claim 2 (*e.g.* claims 3-5 and 7).

Applicant submits Tabaqchali does not anticipate claim 17, which recites detecting a *Helicobacter pylori* nucleic acid at least 600 nucleotides in length. The Office action points, for example, to page 10, lines 14-31. Indeed, a table at the top of page 10 lists a number of primer pairs and the lengths of the fragment amplified by each pair. No pair is reported to amplify a nucleic acid at least 600 nucleotides in length. Indeed, nowhere does Tabaqchali disclose detecting a nucleic acid at least 600 nucleotides in length. Accordingly, Applicant submits that Tabaqchali does not anticipate claim 17.

Applicant submits that Tabaqchali does not anticipate claim 18, which recites detecting a human nucleic acid. Tabaqchali discloses detecting an *H. pylori* nucleic acid. Tabaqchali does not disclose detecting a human nucleic acid. Accordingly, Applicant submits that Tabaqchali does not anticipate claim 18.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim rejection under 35 U.S.C. § 103

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Li in view of U.S. Patent No. 6,143,529 ("Lapidus"). Applicant respectfully traverses this rejection.

Claim 9 depends from claim 1, incorporating by reference the limitations of claim 1. Claim 1 recites identifying a patient as having a current *Helicobacter pylori* infection if a nucleic acid is present in a patient stool sample in a length and an amount indicative of infection. As

discussed above, Li does not disclose identifying a patient as having a current *Helicobacter pylori* infection if a nucleic acid is present. Lapidus does not correct the deficiencies of Li. Lapidus relates to "assays for markers indicative of cancer or precancer" (Lapidus, Abstract). Lapidus does not discuss *Helicobacter pylori*, its identification, or the likelihood that *Helicobacter pylori* nucleic acids would be present in a patient stool sample. Thus, even in combination, Li and Lapidus fail to render the claimed invention obvious. Furthermore, Li teaches away from the claimed invention, concluding "that currently PCR assays of fecal specimens may not be useful for the diagnosis of *H. pylori* infection" (Li, p. 2148). Accordingly, Applicant submits that Li and Lapidus do not render obvious the invention of claim 9.

Applicant respectfully requests reconsideration and withdrawal of the rejection.

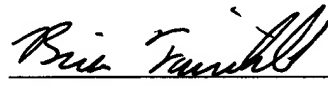
CONCLUSION

Claims 1-9, 17-20 and 24 are pending and presented for consideration. Examiner Chunduru is invited to telephone the undersigned agent to discuss any remaining issues. Applicant believes that no fee and no extension of time are required for entry and consideration of this paper. Nevertheless, if either is required, please consider this a conditional petition for any required extension and authorization to charge any required fee to Deposit Account No. 20-0531.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDED CLAIMS
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1. (Twice Amended) A method for detecting a *Helicobacter pylori* infection, the method comprising the steps of:

detecting a *Helicobacter pylori* nucleic acid present in a patient stool sample [and having a length exceeding a reference length]; and

identifying the patient as having a current *Helicobacter pylori* infection if the nucleic acid is present in a length and an amount indicative of infection, the amount exceeding an [a reference] amount indicative of an absence of current *Helicobacter pylori* infection.

18. (Twice Amended) A method for detecting a *Helicobacter pylori* infection in a patient, the method comprising the steps of:

detecting a human nucleic acid in a patient stool sample comprising shed cells or cellular debris; and

identifying the patient as having disease if the length of the nucleic acid [exceeds a reference length] is indicative of infection.

19. (Amended) The method of claim 1, wherein the [reference] length is a length of 175 nucleotides.

20. (Amended) The method of claim 1, wherein the [reference] amount indicative of infection is a detection threshold.